IN THE CLAIMS:

1 (previously presented). A method of modifying the structure of a workpiece, the method comprising:

1) causing relative movement between a power beam and the workpiece so that a region of the workpiece is melted and the melted material displaced to form a projection at a first location in the region and a hole at a different location in the region;

2) allowing the melted material at least partially to solidify; and thereafter

3) repeating step 1) numerous times, wherein the region which corresponds to each repeat intersects the region of step 1) and wherein the melted material is displaced during the numerous repetitions of step 1) such that either or each of the said projection or hole are increased in size in comparison with their respective size following a preceding application of step 1).

2 (previously presented). A method according to claim 1, wherein step 3) further comprises repeating step 2) following each repeat of step 1).

3 (previously presented). A method according to claim 1, wherein the region is defined by the beam being caused to travel relative to the workpiece along a path from a start position to a finish position.

4 (original). A method according to claim 3, wherein the first location is at one of the start or finish positions and the different location is at the other of the start or finish

positions.

5 (previously presented). A method according to claim 3, wherein the path is at least three beam diameters in length.

6 (previously presented). A method according to claim 1, wherein at least part of the region is elongate.

7 (original). A method according to claim 6, wherein the region is substantially rectilinear.

8 (previously presented). A method according to claim 1, wherein at least part of the region is curved.

9 (previously presented). A method according to claim 1, wherein the modification comprises a modification of substantially the bulk structure of the workpiece.

10 (previously presented). A method according to claim 1, wherein the modification comprises a modification of substantially the surface structure of the workpiece.

11 (previously presented). A method according to claim 1, wherein each of the regions of step 3) coincides substantially with the region of step 1).

12 (previously presented). A method according to claim 1, further comprising forming one or more groups of regions, each group intersecting the region of step 1).

13 (original). A method according to claim 12, wherein the holes of each group are substantially co-incident with the hole of the region of step 1).

14 (previously presented). A method according to claim 12, wherein the projections of each group are substantially coincident with the projection of the region of step 1).

15 (previously presented). A method according to claim 12, wherein the groups of regions are arranged in a regular array.

16 (previously presented). A method according to claim 1, wherein during step 2), the power beam forms one or more regions elsewhere on the workpiece.

17 (previously presented). A method according to claim 1, wherein the workpiece is provided with another material so that one or more alloys are formed during performance of the method.

18 (previously presented). A method according to claim 1, wherein steps 1)-3) are carried out in a gaseous atmosphere so that one or more alloys is formed.

19 (previously presented). A method according to claim 1, wherein the intersecting regions are arranged so as to form projections which overhang the workpiece surface.

20 (original). A method according to claim 19, wherein two or more overhanging projections are joined so as to form one or more loops above the workpiece surface.

21 (previously presented). A method according to claim 1, wherein the power beam energy density is reduced during step 3) with respect to the one or more previous movements of the power beam, so as to smooth the edges of the projection and/or hole formed.

22 (previously presented). A method of preparing a workpiece in the form of a member, for joining to one or more further workpieces, comprising forming a multiplicity of holes in the surface and/or bulk of the member and forming outward projections from the member surface, using the method according to claim 1.

23 (original). A method according to claim 22, wherein one or more of the size,

shape or relative arrangement of the holes, and/or one or more of the size, shape, relative arrangement or chemical composition of the projections, is controlled in a predetermined manner.

24 (previously presented). A method according to claim 22, wherein the projections and/or holes are formed so as to mechanically engage with the workpiece(s) to which the member is joined.

25 (original). A method according to claim 24, wherein the projections are arranged so as to interact with complementary structures within the workpiece(s).

26 (previously presented). A method according to claim 22, wherein the holes are of a suitable size to accommodate an adhesive or resin.

27 (previously presented). A method according to claim 22, wherein the projections and/or holes are formed such that, in use, the projections and/or holes cooperate with the workpiece(s) so as to distribute any stresses within the joint between the workpiece(s) and the member, and thereby reduce stress concentrations within the joint.

28 (previously presented). A method according to claim 22, wherein the projections and/or holes are arranged so as to provide predetermined local mechanical,

physical or thermal properties.

29 (original). A method according to claim 28, wherein the projections and/or holes are arranged in at least part of the member so as to cause the local thermal and/or mechanical properties in that part of the member to be substantially the same as those of the workpiece(s) to which that part of the member is to be joined in use.

30 (previously presented). A method according to claim 22, wherein the projections and/or holes are arranged so as to control the manner of failure of the joint.

31 (previously presented). A method according to claim 22, wherein the member is an intermediate member for use in joining two or more further workpieces together.

32 (previously presented). A workpiece that has been treated using the method according to claim 1.

33 (previously presented). A method of joining a first workpiece to one or more further workpieces, comprising preparing the first workpiece for joining using the method according to claim 22, and joining the first workpiece to the one or more further workpiece(s).

34 (previously presented). The method according to claim 2 wherein the region

is defined by the beam being caused to travel relative to the workpiece along a path from a start position to a finish position, and wherein the path is at least three beam diameters in length.

35 (previously presented). The method according to claim 2, wherein the projection is further built up and/or the hole is further excavated as a result of step 3).

36 (cancelled).

37 (previously presented). The method according to claim 2, wherein repeated intersection of the regions causes one or each of the projection or hole to increase in size.

38 (previously presented). The method according to claim 2, wherein material is repeatedly displaced so as to form a different geometry or structure as a result of each repeat according to step 3) due to the at least partial solidification between each repeat according to step 2).

39 (previously presented). The method according to claim 2, wherein in step 3) the melted material is displaced so as to at least partially solidify upon the material which was melted during a previous step 1).

40 (previously presented). The method according to claim 1, wherein the beam travels along a respective beam path during each repeat of step 1), and wherein a plurality of intersecting beam paths are used to form the projection or hole and wherein for each beam path the respective molten material displaced is allowed to at least partially solidify before the beam is caused to travel along a subsequent said beam path.

41 (cancelled).

42 (previously presented). The method according to claim 2, wherein material is repeatedly displaced so as to form a different geometry or structure as a result of each repeat according to step 3) due to the at least partial solidification between each repeat according to step 2).

43 (previously presented). A workpiece that has been treated using the method according to claim 42.

44 (new). A method of modifying the structure of a workpiece, by the controlled formation of numerous features of predetermined geometry using a power beam, wherein each feature is positioned at a predetermined location and wherein each of the numerous features is formed according to the steps of:

1) causing relative movement between a power beam and the workpiece

so that a region of the workpiece is melted and the melted material displaced to form a projection at a first location in the region and a hole at a different location in the region;

2) allowing the melted material at least partially to solidify; and thereafter

3) repeating steps 1) and 2), numerous times, wherein the region which corresponds to each repeat according to step 3) intersects the region of step 1), wherein for each repeat of step 1) the beam travels along a respective beam path having a length of three or more beam diameters, wherein a plurality of intersecting beam paths according to step 3) are used to form the said projection or said hole, wherein for each beam path at least part of the molten material displaced is allowed to solidify before the beam is caused to travel along a subsequent said beam path and wherein for each beam path said at least partial solidifying of said material either adds material to the said projection or removes material from the said hole, so as to form a different geometry or structure of the said projection or hole as a result of the numerous repeats according to step 3).

45 (new). A workpiece that has been treated using the method according to claim 44.